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(54) Title: SOLUBLE RNA POLYMERASE PROTEIN AND METHODS FOR THE USE THEREOF

(57) Abstract: A polymerase protein originating from a eukaryotic cell and involved in the RNA silencing pathway is for the first time provided in a purified soluble form that possesses a detectable RNA polymerization activity. This polymerase is useful in methods and kits for *in vitro* RNA synthesis. A polymerase of the invention copies ssRNA templates to produce two types of reaction products: short and long RNA copies. It can also copy ssDNA templates. The polymerization does not require a primer for the initiation of RNA synthesis, although RNA synthesis can be also initiated in the presence of a primer. In addition to standard nucleotides polymerase of this invention also accepts a number of modified nucleotides. The polymerase is useful in many downstream applications such as production of labeled RNA probes or generation of trigger RNA molecules to induce RNA interference effects in living cells or suitable *in vitro* systems.

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